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THE USE OF DIELDRIN FOR SHEEP MAGGOT FLY CONTROL

BY

L. C. STONES, J. C. WOOD AND C. B. HART

THE COOPER TECHNICAL BUREAU, BERKHAMSTED

INTRODUCTION

Many writers have, in the past, drawn attention to the shortcomings of field trials as a means of assessing the comparative value of different methods of treating sheep for maggot fly control. In order to overcome some of the difficulties, a closely controlled method of test was developed by one of the writers (Stones, 1951). In this test small groups of treated sheep are exposed at weekly intervals to an artificially bred population of ovigerous maggot flies (*Lucilia sericata*). By examining the sheep after each exposure it is possible to determine at what time after treatment the method of control in any group fails to provide protection against oviposition. Similarly, by applying a larval implantation test each week, it is possible to decide just when the treatment applied to any group is no longer able to inhibit the development of larvae and the establishment of a strike. Although this method of test has proved most valuable as a means of *comparing* the protection provided by different treatments, it is still necessary to carry out field observations in order to determine the true length of protection provided in the field by any selected treatment.

In 1951 the new insecticide Dieldrin was subjected to the comparative test, and the results obtained were so outstanding that in subsequent years it was further investigated both by this means and in field trials. The results obtained by both methods of test form the substance of this communication. It is intended that a later publication should consist of a more comprehensive account, together with full experimental details.

A.—CONTROLLED TESTING TECHNIQUE

The first property of Dieldrin to be observed, as a result of exposing treated sheep to ovigerous flies, was its inability to inhibit oviposition. Within one week of the sheep being dipped in a 0·3 per cent. Dieldrin emulsion, eggs were laid freely in the fleece. This does not indicate any absence of insecticidal activity, since flies making contact with the fleece died within 24 hours, but rather that its action is too slow to interfere with oviposition. Such action should be contrasted with that of DDT, which up to now has proved to be the most effective " fly " dip insecticide, for use in Britain, and which is able to prevent oviposition for approximately 8 to 10 weeks under the same conditions.

The outstanding properties of Dieldrin became apparent when it was subjected to the larval implantation test. It was found that here again its action was slow, since it did not kill newly emerged larvae for from 24 to 36 hours. Death, however, invariably occurred and this action persisted for 24 weeks after treatment.

The larvicidal properties of Dieldrin have been reported by du Toit & Fiedler (1953), but in the light of our experience they have not demonstrated the outstandingly long protection provided by this insecticide as compared with the other agents tested. Thus they claim that gamma-BHC, at a concentration of 0·5 per cent., is only slightly less effective in this respect than is Dieldrin at comparable concentration. They claim for each insecticide a protection against strike of the order of 30 weeks. Whilst we would agree broadly with this finding in the case of Dieldrin, it has not been found possible to obtain anything like this protection with BHC. The difference between these two insecticides is even more marked when they are used at lower concentrations. As will be seen from the figures below, Dieldrin at 0·05 per cent. is still effective for approximately 20 weeks, under the conditions of test, whilst gamma-BHC will only protect for about five weeks at this concentration. Such a finding for BHC is amply confirmed by the experience of numerous workers in the field, who have used this insecticide for maggot fly control at a concentration of 0·5 per cent. (total isomers) equivalent to approximately 0·06 per cent. gamma-BHC, *e.g.*, Hughes *et al.* (1947); Shanahan (1951).

The following figures, arrived at by the technique outlined above, indicate the relative merits of the insecticides in question, when applied by dipping, both from the point of view of inhibiting egglaying and as larvicides :—

Insecticide	Formulation	Concentration per cent.	Oviposition inhibited	Larvicidal protection
DDT	Wettable powder	4·0 p.p.' DDT	14 weeks	—
"	" "	0·4 " "	9 "	—
BHC	" "	0·6 gamma BHC	5 "	12 weeks
"	" "	0·06 " "	1 week	5 "
Dieldrin	Water miscible preparation.	0·30	Not inhibited	25 "
"	A solution of Dieldrin in solvent naphtha with synthetic surface active agents as emulsifiers.	0·15	" "	21 "
"	Water miscible preparation using creosote as a solvent and soap as an emulsifier.	0·05	—	21 "
		0·01	—	18 "
		0·005	—	13 "
"	Wettable powder	0·05	—	21 "
"	" "	0·01	—	14 "

The DDT used was a technical grade containing 80 per cent. of the para para isomer. The BHC was also technical and contained 13 to 15 per cent. of the gamma isomer. The Dieldrin was American " flake Dieldrin." For the 0·30 and 0·15 per cent. concentrations it was used in the form of a solvent naphtha emulsion, but for the lower concentrations a phenolic emulsion was used, except, of course, where it was used as a wettable powder.

In addition to testing Dieldrin when applied by dipping, we tried the effect of a light surface spray of a phenolic emulsion of Dieldrin on two groups of sheep included in the test. In one group the sheep were in full fleece and in the other they carried about six weeks' growth of wool. The spray, containing 0·15 per cent. Dieldrin, was applied with a hand-operated mist sprayer at the rate of half a gallon per sheep, applied evenly over the whole body. It will be appreciated that this type of treatment does little more than wet the tip of the fleece, and

results in no significant penetration. In spite of this it was found that the resulting larvicidal protection was of roughly the same duration, both on the long-fleeced and short-fleeced sheep, as it was where a similar Dieldrin concentration had been applied by dipping.

This result was somewhat surprising. Our previous experience with other insecticides had shown that the resulting protection is markedly reduced when the insecticide is applied without achieving effective penetration of the fleece. du Toit & Fiedler (1953) state that Dieldrin possesses the property of being able to diffuse down the staple on to wool which was not treated initially.

B.—Field Trials

Having established, by means of the controlled testing technique, that Dieldrin is not only extremely active larvicidally, but is also remarkably persistent in the fleece, a small-scale test was carried out under field conditions in 1952. The results were very satisfactory and warranted a much more extensive trial being carried out the following year. Fortunately, it was also possible to enlist the aid of colleagues in Australia, New Zealand and South Africa to carry out field trials under the particular conditions operating in those countries. The results of these overseas trials will be recorded elsewhere.

In carrying out the field trials in this country, no attempt was made to arrange fully controlled experiments. Not only is it very difficult to do this, but frequently when the experimental work is completed it is still open to some criticism as regards the validity of the results. The controlled testing method had already shown, beyond doubt, that Dieldrin was outstandingly effective for maggot fly control. It was therefore only necessary, in field trials, to determine the true length of protection, the optimum concentration, and its value in the control of such specialised conditions as crutch strike in highly susceptible sheep. One property of Dieldrin, namely, the very long protection which it provides, is of considerable importance in increasing the significance of the results obtained in an uncontrolled trial. It is quite possible, in this country, that the absence of strike over a period of, say, four weeks, would be due to the absence of "fly" activity, but that "fly" should be absent during almost the entire season is most improbable. This is especially true when the trial involves numerous farms distributed widely over the country.

In assessing the control achieved with Dieldrin in the field, some account has been taken of (1) the normal seasonal incidence of strike, (2) any indication of "fly" activity in the surrounding district, including the presence of abortive strikes on the treated sheep, and (3) the achievement of almost complete control over the entire season.

First Trial

This trial was conducted personally by one of the writers on a farm which has been under his observation continuously for many years. The flock consists of approximately 180 pedigree Southdown sheep, of which about 80 are lambs. These sheep, and in particular the lambs, are highly susceptible to crutch strike, and on this occasion were intentionally left "undagged" and therefore became very dirty. During the previous five years the incidence of strike in this flock, even when dipped on two or three occasions during the season in 0·3 per cent. DDT, was never lower than 20 per cent. and even reached 35 per cent. If the lambs are considered separately, then a much higher figure of 40 to 50 per cent. is normal.

In 1952 the lambs were crutch-jetted at the beginning of July with 0·15 per cent. Dieldrin. The adult sheep were dipped in a wash of the same concentration of Dieldrin in the middle of July. As a result of these treatments no crutch strikes were observed on any of the sheep for the remainder of the season (approximately 12 weeks). Out of the 83 lambs which had been treated only in the *crutch*, four developed *body* strikes early in August, *i.e.*, after five weeks. Body spraying of all the lambs at this time with 0·15 per cent. Dieldrin prevented the development of any further body strikes.

During the period of the trial maggot fly activity was judged to be about normal. On an adjacent farm 15 strikes occurred in 61 untreated sheep at the beginning of August. Again, the presence of "fly" was demonstrated in September, when crutch strikes occurred in a number of Dorset horn sheep on the same farm, these having been dipped five weeks previously in a 0·3 per cent. DDT dip-wash.

Although the above evidence cannot be accepted as conclusive proof, it is considered highly significant that crutch strike should have been completely eliminated for the entire season from a highly susceptible flock, which previous experience had shown to have a high normal incidence of crutch strike.

Second Trial

Three dips were used in this trial. Two were phenolic emulsions which were used at concentrations of 0·10 and 0·05 per cent. Dieldrin respectively, and one a wettable powder used at 0·05 per cent. Dieldrin. The flocks included in the trial were divided into two categories which, for the sake of convenience, will be called *supervised* and *unsupervised*.

The dipping of the supervised flocks was carried out in the presence of one of the writers, although no attempt was made to change the dipping procedure normally adopted by the farmer. After dipping, regular visits were made to these farms until the end of the maggot fly season. The last strikes were reported on October 7th, and this date has arbitrarily been taken as the end of the maggot fly season. The supervised flocks were selected from those within a 100-mile radius of Berkhamsted with the result that they were situated in the southern counties of England where maggot fly activity was greater during the summer of 1953 than in counties farther north. This accounts for the greater number of strikes observed in the supervised flocks compared with those in the unsupervised flocks.

The unsupervised flocks were dipped by the owners themselves, who were asked to keep a record of the strikes observed. Each farmer submitted two reports, one in August and the other in late October at the end of the "fly" season. The flocks in this category were scattered throughout 21 counties in the South-West, the Midlands and the North of England, and in nine counties in Wales. Three flocks were in Scotland.

The results obtained in the supervised flocks are shown diagrammatically in Figs. 1, 2 and 3. The presence of "fly" activity is indicated, whenever it was known to have occurred, by a shaded area. It must be emphasised, however, that the absence of such shading does not necessarily indicate that no "fly" activity was present. In some flocks no untreated sheep were available to indicate the presence of "fly," and in others the treated sheep were never examined closely for the presence of small abortive strikes or dead larvae. The protection was therefore known to have been challenged in some flocks, whilst in others the challenge could only be assumed by virtue of the very long period of observation.

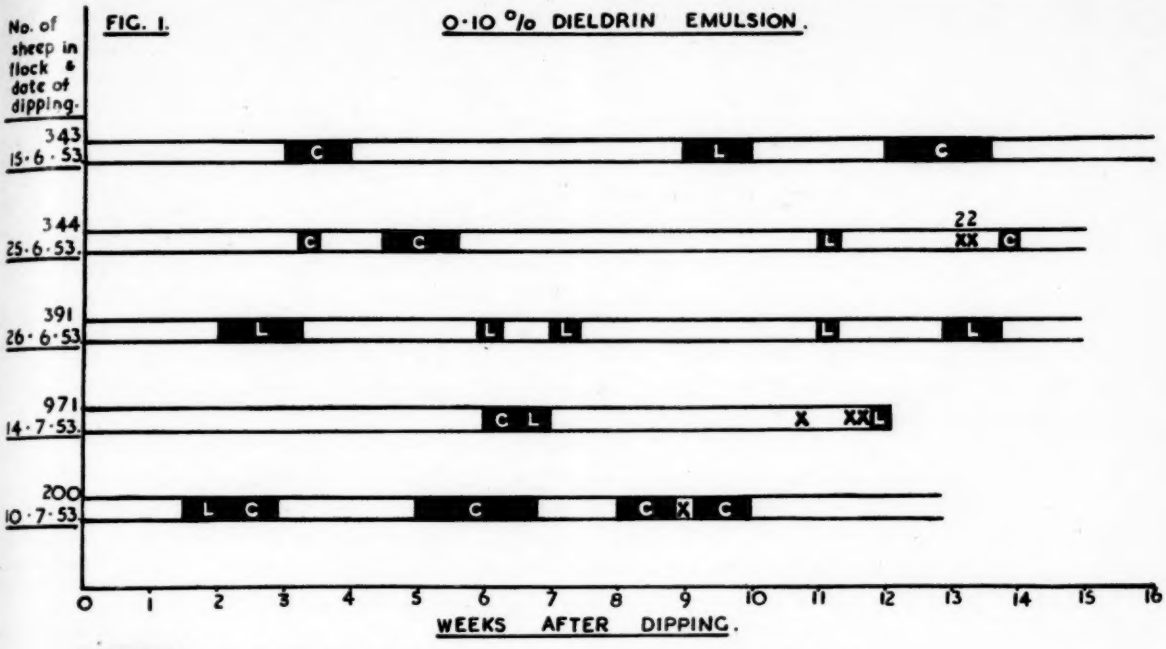
0·10 Per Cent. Dieldrin Emulsion

(*a*) *Supervised flocks.*—Five flocks—2,249 sheep.

The period of observation varied from 85 to 114 days after dipping.

No body strikes were observed. Strikes were reported on the tails of seven ewes at an interval of 75 to 92 days after

FIG. 1. 0·10 % DIELDRIN EMULSION.

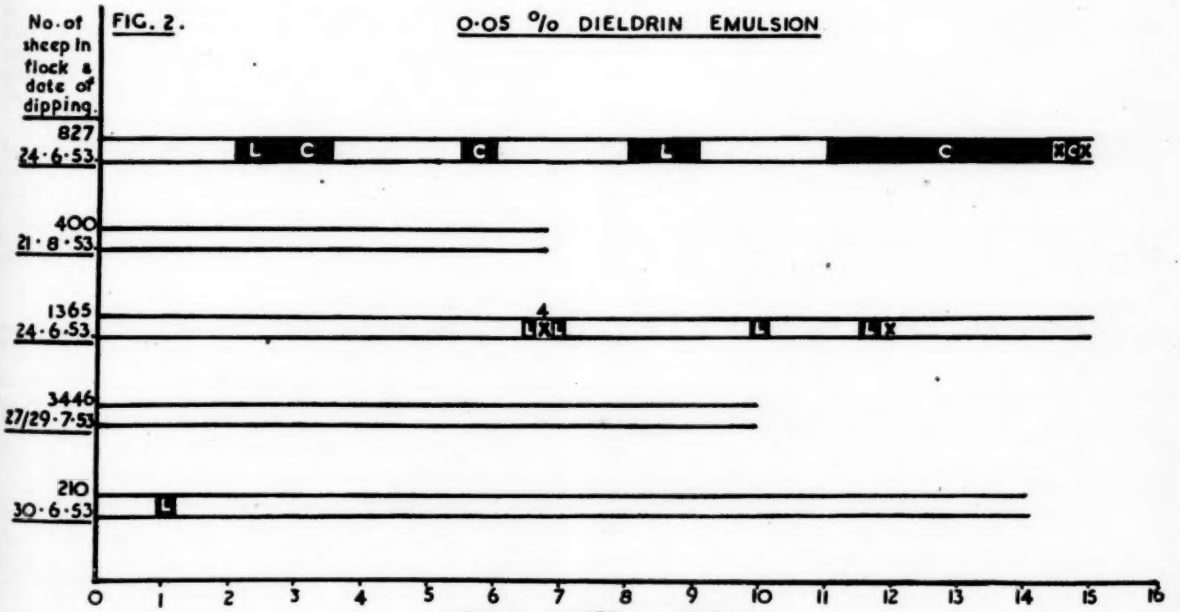


C A challenge to protection indicated by strikes on control sheep.

L A challenge to protection indicated by dead larvae on dipped sheep.

2 / X A crutch strike on one or more dipped sheep as indicated.

FIG. 2. 0·05 % DIELDRIN EMULSION



C A challenge to protection indicated by strikes on control sheep.

L A challenge to protection indicated by dead larvae on dipped sheep.

2 / X A crutch strike on one or more dipped sheep as indicated.

dipping. In addition, a very small strike lesion was found on the breech of a dirty lamb 63 days after dipping. This was dressed by the shepherd and it is not known whether the larvae would have survived.

Although selected at random this group of five flocks was exposed to more intense "fly" activity than the five supervised flocks dipped in the 0·05 per cent. Dieldrin emulsion.

(*b*) *Unsupervised flocks.*—Twenty flocks—8,044 sheep.

The period of observation varied from 51 to 107 days after dipping. No strikes were reported, although several owners observed dead larvae in the wool.

0·05 Per Cent. Emulsion

(*a*) *Supervised flocks.*—Five flocks—6,248 sheep.

The period of observation varied from 47 to 105 days after dipping. No body strikes were observed but seven breech strikes were reported, 49 (4), 84, 102 and 105 days after dipping.

(*b*) *Unsupervised flocks.*—Twenty flocks—11,360 sheep.

The period of observation varied from 55 to 112 days after dipping. No body strikes were observed.

Three breech strikes on lambs were reported, 49, 56 and 70 days after dipping. Newly hatched larvae were observed on the breech of lambs on two occasions, 45 days after dipping, but these were dressed by the shepherd and it is not known whether they would have survived.

0·05 Per Cent. Dieldrin Suspension

Supervised flocks.—Five flocks—1,940 sheep.

The period of observation varied from 75 to 132 days after dipping. No body strikes were observed.

Twenty-eight breech strikes were reported at intervals from 55 to 101 days after dipping, 17 of these occurring in one flock 81 to 88 days after dipping.

Discussion

A consideration of the above results indicates that the initial findings for the properties of Dieldrin, as determined by the controlled testing technique, have been well substantiated by its use in the field. This insecticide was found to be chiefly larvicidal in its action, and though its rate of kill was slow it was, nevertheless, certainly lethal for the larvae of the maggot fly, *L. sericata*. This property was demonstrated on numerous occasions in the field trials when small incipient strikes were observed which subsequently failed to develop.

In the initial comparative tests Dieldrin was found to confer a protection of very much greater duration, even at lower concentrations, than has been achieved with any other insecticides in general use for maggot fly control. In the field results, too, this was apparent. At a concentration of 0·05 per cent., Dieldrin completely inhibited body strike and was effective in controlling crutch strike for two months or more. In the past, although DDT and BHC have given good protection of the order of five to seven weeks against body strike, the protection conferred against crutch strike has been much less certain, and on very susceptible sheep has often been no more than two or three weeks.

It is difficult from the trials to decide on a precise figure for the length of protection conferred. The figures quoted for the initial controlled technique are of value for comparative purposes only, and no claim is made that they represent the field protection. In the field trials it is clear that Dieldrin at 0·05 per cent. controlled body strike for the entire period of observation (approximately 12 to 16 weeks). The control of crutch strike at this concentration was also good. Bearing in mind the number of sheep involved, it can be claimed that the rate of crutch strike up to 10 weeks was almost negligible. It is suggested, therefore, that a solid protection of 8 to 10 weeks is near to the correct value for Dieldrin at 0·05 per cent.

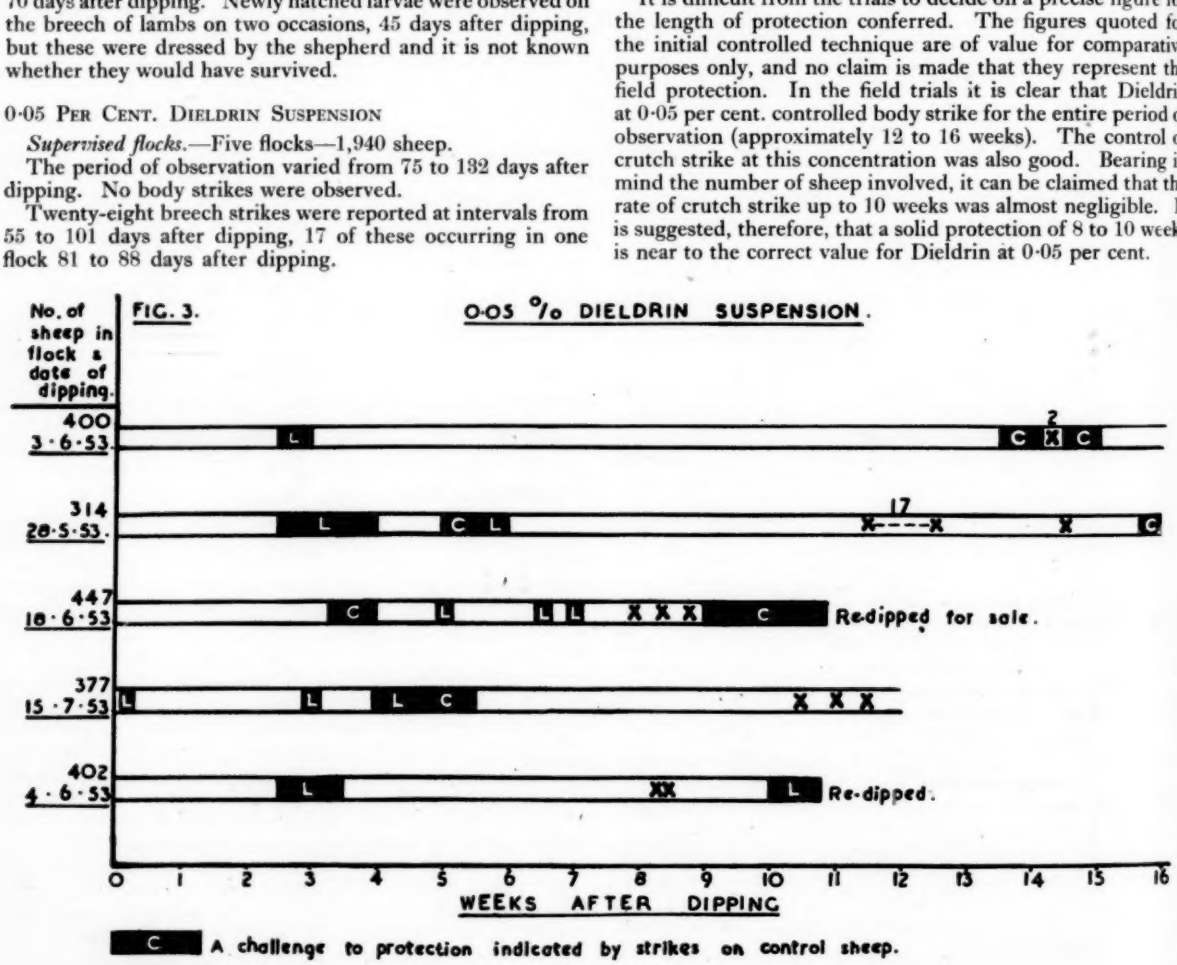


FIG. 3.
0·05 % DIELDRIN SUSPENSION.
No. of sheep in flock & date of dipping.
400
3·6·53
314
28·5·53
447
18·6·53
377
15·7·53
402
4·6·53
Re-dipped for sale.
Re-dipped.
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
WEEKS AFTER DIPPING
C A challenge to protection indicated by strikes on control sheep.
L A challenge to protection indicated by dead larvae on dipped sheep.
A crutch strike on one or more dipped sheep as indicated.

Turning to the question of selecting the optimum concentration at which Dieldrin should be used, it is again difficult to arrive at a precise figure from the trials. The initial tests suggest that 0·05 per cent. is near the marginal level of efficiency and that 0·01 per cent. is probably too low. This is especially true when one takes into account such factors as the exhaustion of wash in the bath, the control of crutch strike on highly susceptible sheep, and the occurrence of unusually severe "fly" conditions. In the field trials reported here, little or no advantage was demonstrated when the insecticide was used at 0·10 per cent. However, it is probable that the period of observation was not sufficiently long, and the "fly" conditions were not sufficiently severe, to bring out the true difference. In addition, in the supervised trials it is probable that the challenge to protection was more intense on those farms where the higher concentration was used. Reference has already been made to this difficulty of obtaining truly comparable conditions in field trials.

Until more evidence is available, we would suggest that a Dieldrin concentration of 0·05 per cent. is satisfactory for maggot fly control in this country. It may well be that under more severe conditions in other parts of the world (for example, for the control of crutch strike on Merino lambs), it may be necessary to employ a higher concentration. If higher concentrations are used, the difference is likely to be reflected more in the degree of protection obtained than in an extension of the length of protection.

These observations should not be concluded without some reference being made to the results obtained when Dieldrin was applied to sheep as a light surface spray at 0·15 per cent. As yet, this treatment has only been tested by the controlled technique. The protection obtained was found to be closely comparable to that obtained by dipping. Should this result be confirmed in the field, it will indicate that Dieldrin possesses a property not so far found for any other insecticide. In the past it has not been possible to obtain satisfactory maggot fly control by light spraying in the "run-through" type of spray race. It may now be possible to reconsider this method of control. It should be pointed out, however, that now that it is possible to obtain such very long protection by a single dipping, a quick spraying method loses a certain amount of its attraction. The chief attraction of spraying is its speed and simplicity where the treatment has to be repeated frequently owing to the short duration of the protection imparted.

Summary

An account is given of three trials in which the new insecticide, Dieldrin, was tested as an agent for maggot fly (*L. sericata*) control. Initially a controlled testing technique was employed to determine the value of the insecticide at different concentrations as compared with other agents commonly used. Subsequently the findings from these tests were confirmed in extensive field trials involving a total of nearly 30,000 sheep.

Dieldrin was found to possess outstanding larvicidal properties and to be remarkably persistent in the fleece. As a result it was found to provide very effective maggot fly control, both against body strike and crutch strike, for a prolonged period. Sheep dipped in a Dieldrin emulsion, or water suspension, at a wash concentration of 0·05 per cent. were completely protected against body strike for the duration of the trial (approximately 12 to 16 weeks), and against crutch strike for 8 to 10 weeks. It is uncertain whether any advantage is gained by the use of higher concentrations. Preliminary tests indicated that it may be possible to achieve effective maggot fly control when this insecticide is applied to sheep as a light surface spray.

Acknowledgment.—The writers wish to express their thanks to those members of the Cooper Technical Bureau who have helped them both with the experimental work and with the preparation of this paper. They are also grateful to Messrs. Cooper, McDougall & Robertson for their permission to publish the results.

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THE NORMAL FLORA OF THE BOVINE RUMEN. I.—BACTERIOLOGICAL METHODS FOR QUANTITATIVE STUDIES

BY

MARION K. WILSON

AND

C. A. E. BRIGGS

National Institute for Research in Dairying, Shinfield, Reading

A comprehensive review of work on the bacterial flora of the bovine rumen has been published recently by Doetsch & Robinson (1953). The observations of early workers were based chiefly on the limited information afforded by the microscope alone or by simple cultural methods, but it is now generally recognized that specialised *in vitro* techniques are necessary for a more complete solution of the problem (Doetsch, Robinson & Shaw, 1952 ; Huhtanen, Rogers & Gall, 1952 ; Hungate, 1952 ; Sijpesteijn, 1951 ; Heald, Krogh, Mann, Appleby, Masson & Oxford, 1953). Preliminary explorations (development of media and methods) in the work described here proceeded on somewhat similar lines to those of the American schools, but with emphasis on less cumbersome techniques suitable for speedy use on a large scale. The resultant technique has been used to determine variations in the "total" viable count of bacteria in the rumen of animals under controlled conditions ; this we consider an essential background to the investigations of more specific nature and wider application envisaged in direct collaboration with other Departments of this Institute. A detailed account of the present investigations will be published later, pending which the following observations may be of immediate interest.

In media studies, no marked improvement in growth was observed when "Reinforced Clostridial Medium" (Hirsch & Grinsted, 1954), buffered with $NaHCO_3$ and saturated with CO_2 (see Report, National Institute for Research in Dairying, 1952), was enriched with horse serum, Tween 80 or cellobiose ; but the addition of Tween 80 (polyoxyethylene sorbitan monooleate) to dilution blanks resulted in a small but consistent improvement in counts. This may be attributable to a more complete separation of bacteria in aggregation and from food particles occasioned by the physical properties of Tween 80. Doetsch *et al.* (1952) also included Tween 80 in their dilution blanks but gave no details of its action. In comparisons of incubation times and temperatures no great disparity in final count was observed between 37° and 39° C., although the latter more closely approximates the temperature within the rumen. This temperature (39° C.) has been adopted as routine partly for this reason, but more particularly because it

permits the incubation time to be shortened—an advantage in work of this nature where slow-growing bacterial types may be encountered. We have not observed organisms requiring more than 10 days' incubation for development, notwithstanding a report in the American literature of rumen bacteria requiring 30 days' incubation (Huhtanen *et al.*, 1952).

Rumen samples from adult cows rather than from calves have been used, since the flora in the adult is likely to be more stable than in the young growing animal ; moreover, certain sampling difficulties were obviated owing to the larger fistula in the adult. This made it unnecessary to develop a specialised instrument for sampling, a decision confirmed by subsequent experience.

A method of assessing the number of viable organisms per gramme of rumen material by serial dilutions (tenfold) prepared directly in the culture medium yielded positive tubes at higher levels than any other technique previously investigated. Counts of 10^{10} and 10^{11} organisms per gramme have commonly been obtained by this technique ; these approach the total microscopic count and also compare favourably with the maximum viable counts reported by other workers. Microscopic examination of the bacterial growth obtained in high dilution revealed a mixed population, chiefly of gram-positive cocci and rods of varied morphology ; gram-negative organisms were rarely present beyond 10^6 to 10^7. Hence it can be claimed that a considerable proportion of the viable population of the rumen is being cultivated *in vitro*. Owing to the economy in time and materials resulting from the adoption of this technique it has been possible to proceed rapidly with a study of variation in total numbers of viable bacteria in the " normal " rumen. Firstly, however, variation of numbers with time after sampling was investigated in order to determine the number of replicate samples which could be handled in a given period of time. As a rule, half-hourly estimations of the viable count of material held at room temperature for three, or even 24 or 48 hours, showed a variation from the original no greater than that occurring between replicate samples treated identically throughout. Since, however, a few samples showed a tenfold drop in count within 30 minutes of sampling, precautions have been taken to avoid undue delay between the removal of a sample from the rumen and the completion of the appropriate bacteriological examination : the over-all period involved has been less than seven minutes per sample.

Replicate samples from five sites within the rumen, and samples of rumen liquor and solid material showed up to one thousandfold differences in count ; variations from cow to cow, day to day and hour to hour were of the same order, hourly observations being made on three cows over a 25-hour period ; this included two routine feeding times, but no correlation between fluctuations in count and time after feeding was observed. The effect of dietary changes on the total viable count was investigated in cows receiving the following rations :—

16 lb. hay + 8 lb. concentrates,
6 lb. „ + 12 lb. „
hay *ad lib.*,
grazing on grass,
„ „ „ + strip folding on kale.

The variations in count observed were no greater than those obtaining with the previously mentioned factors, or than those in a single animal on a fixed diet. Thus the total viable population of the rumen of a normal animal may fluctuate between 10^8 and 11^{11} organisms per gramme, and these limits also apply under widely differing conditions of diet. This is of particular importance since other workers have frequently regarded much smaller over-all changes to be indicative of significant major alteration in the flora (Louw & Van-der-Wath, 1943 ; Williams & Moir, 1951 ; Johnson, Hamilton, Robinson & Garey, 1944 ; Gall, Smith, Becker, Stark & Loosli, 1949).

These observations provide a foundation for future studies of the *types* of rumen bacteria and their relative significance in the economy of the host.

Acknowledgment.—We are indebted to Dr. C. C. Balch and his colleagues in the Feeding and Metabolism Department, with whom further collaborative work is planned, for placing their animals at our disposal in these preliminary studies, and for supplying samples.

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ABSTRACTS

Pregnancy Disease in Sheep*

The clinical symptoms, pathology and physiology of pregnancy toxaemia of ewes are reviewed. In considering the aetiology the author states that the production of cortisone-related hormones is interfered with. This is linked with increased pituitary activity and enlargement of the adrenals near parturition. The conversion of amino-acids into blood glucose (gluconogenesis) is reduced. Fat is therefore used as a source of energy, and its combustion is incomplete, resulting in the formation of acetone bodies, and in acidosis.

Ketogestin, a cortisone-like hormone, accelerates glyconogenesis but has not the undesirable side-effects of other adreno-cortical hormones. On the basis of success in bovine ketosis using ketogestin a trial was carried out in pregnancy toxaemia.

Doses ranging from 500 mg. to 1 gramme were given intramuscularly on up to five successive days. This was supplemented in some cases with " supportive treatment." Of a dozen clinical cases so treated just over 50 per cent. recovered. In a flock of 34 ewes 12 had already died of pregnancy toxaemia. In the remainder, control was effected by correction of diet and/or prophylactic use of ketogestin 0·5 gramme intramuscularly, or cortisone acetate 50 mg. intramuscularly. Three of the five ewes which showed clinical symptoms died. The success of the therapy depended on the severity and stage of the disease. The author suggests that cortisone-related hormones merit further trial in the therapy and prophylaxis of pregnancy toxaemia.

C. M. E.

* **Pregnancy Disease in Sheep : A Preliminary Report on Prophylaxis and Treatment.** Berrier, H. H., Jun. (1953). *Vet. Med.* **48**. 405–409.

A Brucella Mutant Causing Genital Disease in Sheep in New Zealand*

The investigation of an epididymitis in rams and a possibly related infective disease condition of the foetal membranes of lambs has led to the regular isolation of an organism which has many of the characteristics of the genus *Brucella*. The organism was recovered from the semen of 45 rams and in some cases from lesions in the genital system and from the associated lymph glands. In infected ewes the organism was observed in the colostrum as well as in the foetal membranes, uterine exudate, foetal lungs and abomasal contents. On primary isolation the colonies appeared to be smooth but individual colonies were sensitive to acriflavine. On subculture all colonies were of a non-smooth type.

The condition could be reproduced experimentally by the inoculation of suspensions of recently isolated organisms but one of two cows inoculated intravenously with $2,000 \times 10^6$ organisms during the fifth month of pregnancy resisted infection entirely while the second calved normally but she excreted the organism in her milk. The organism was highly pathogenic to guinea-pigs killing them in three to four weeks, but was less pathogenic to rats and mice.

A close study of its bacteriological characters, including dye sensitivity tests, showed that, despite its CO_2 sensitivity, it might be regarded as a variety of *Br. melitensis* adapted to sheep in a New Zealand environment. Because of its non-smooth character it was not possible to determine its antigenic relationship to other species of the genus *Brucella*.

J. S. P.

* **A Brucella Mutant Causing Genital Disease of Sheep in New Zealand.** Buddle, M. B., & Boyes, Betty W. (1953). *Aust. vet. J.* **29.** 145–153.

* * * * *

Nematode Egg Content of Sheep Faeces*

In the living animal the faecal egg count is the only means of estimating the size of its worm burden but several factors influence the count and these must be taken into account if it is to be of maximum value. To obtain information on daily variations in egg output, three Half-bred × Suffolk shearling sheep, placed in digestibility crates, were fitted with leather harness and close-fitting, rubberised bags in which faeces were collected at two-hourly intervals for six days. The technique used in making the worm egg counts is described and graphs and tables show the " within day " and " day-to-day " variations, total daily faecal output and total daily output of eggs, etc. The data show that the nematode egg content of the faeces from these sheep is not constant throughout the day or from day to day. In fact, variations over even quite short periods are so considerable that it is difficult to place any reliance on a single count on one animal. Whereas the eggs per day count gives a direct measure of the egg output over the 24-hour period, the eggs per gramme count, which is less reliable, is merely an index of the former count distorted by variations in faecal weight and its dry matter content and by other variable factors independent of the faeces. For any given animal the e.p.g. count parallels the e.p.d. count to a considerable degree but not closely enough for comparisons between different animals to be made. The e.p.d. counts show wide variations and allowance must be made for these if the results are to be of any significance. The bearing of the different variations on sampling technique is discussed and it appears that the solution to sampling problems is dependent upon the adequate mixing of the total faecal output.

J. N. O.

* **Variation in the Nematode Egg Content of Sheep Faeces from Day to Day.** Spedding, C. R. W. (1953). *J. Helminth.* **27.** 9–16.

CLINICAL COMMUNICATIONS

TETANUS IN THE DOG AND SEQUELAE FOLLOWING A WOUND, POSSIBLY A HYAENA BITE

K. W. ASPINALL and P. J. MOORHEAD,
Veterinary Officers of the Colonial Service,
Tanganyika Territory

Subject.—Great Dane dog, weight about 130 lb.; age eight years.

History.—The dog had been out hunting and had been missing for about three days. It finally returned home in an exhausted condition with a large wound in its foot.

The wound took the form of a complete penetration high up between the metacarpal bones of the right forefoot, apparently by a large canine tooth. There was also extensive scaling and bruising of the central pad. It was obvious that the animal had lost a considerable amount of blood, and that there might well be extensive damage to the flexor and extensor tendons.

The wound was dressed with propamidine cream and bandaged. A doubtful prognosis was given, and a policy of daily dressings and daily inoculation of penicillin (400,000 units per day) was adopted. After the first day the application of sulphonamide powder to dry the wound was used.

It became apparent after a week that the main arteries supplying the external digit, and possibly its neighbour had been severed, and that as a consequence necrosis had set in and was already extensive.

It was resolved to anaesthetise the animal to determine the extent of the necrosis and, if possible, by radical surgery and curettage to remove all necrotic tissue and yet leave the dog sufficient foot to walk on.

The dog was anaesthetised with nembutal intravenously, the dose required being surprisingly small, 8 c.c. of the 1 gr. per c.c. solution inducing deep anaesthesia. Heart action was very irregular and gave rise to some anxiety during the early stages of the operation.

A careful examination of the wound was made. On the dorsal surface there was a deep puncture some ½ inch in diameter through which two bones showed up clearly together with the remnants of the extensor tendons to the middle toes. On the anterior surface the central pad on the palm of the foot was almost destroyed, and just above it there was a large gap which exposed all four metacarpal bones, which were white and bleached. All the bones on the external digit were exposed on two sides and chalky in appearance. Of the remaining pads all were affected by the prevailing tissue breakdown. Of the flexor tendons there was no sign.

The owner was approached and informed that there was no hope of a complete cure, but that it was possible the dog would be able to walk with a limp.

The dead tissue was first removed, and then the bones of the external digit. The metacarpal bone was sawn through as near as possible to the joint. The skin, and what remained of the musculature of this digit were drawn across the base of the foot with double strong silk sutures and attached to the skin of the internal digit. The effect was to close to some extent the cavity on the back of the foot. The wound was then packed with sulphonamide powder and heavily bandaged, the dressing being renewed every three days.

Apart from an inordinately long recovery period from the anaesthetic the dog showed no untoward symptoms and appeared to be making a gradual recovery. The wound progressed as well as could be expected. There was no sepsis, and within a week the bones were covered with granulation tissue and the cavity on the dorsal surface of the foot was beginning to fill up with actively growing tissue.

Tetanic Symptoms.—About eight days after the operation the owner noticed that the dog was having difficulty in focusing its eyes. It had always been a good catcher of table scraps, but it now seemed unable to judge the throw and invariably missed. It seemed also to be unable to judge openings and tended to bump into the wall when going through doors. A few days later the ears had been drawn together by muscular contraction in the "alert" position, and the dog was unable to co-ordinate swallowing movements. When drinking, a considerable amount of fluid slopped out of the corners of the mouth.

Some two weeks after the operation and three weeks after the wound had been received the condition reached its acme. The symptoms described were present, and if anything more accentuated; the gait was straddling and stiff, and the animal found it difficult to stand on three legs.

Thirty-thousand international units of tetanus antitoxin were injected intravenously followed by a similar amount some three days later. A hopeful prognosis was given in view of the length of time the symptoms had taken to develop. Slops and quiet were advised.

The symptoms gradually disappeared in the reverse order from that in which they had appeared; and some weeks after the height of the infection the last symptom, that of unco-ordinated vision, resolved.

Ten weeks after the original injury, the dog was beginning to take weight on the foot and the bandages were being removed for short periods each day. Some contraction of the cicatricial tissue on the dorsal surface of the foot enabled the dog to put the foot on the ground in the right position, though voluntary flexion and extension was impossible.

* * * * *

TRACHEOTOMY IN A PUPPY

ARTHUR G. WELCH

Brighton

The puppy, an eight-week-old cross Spaniel bitch, was presented three hours after starting a violent attack of choking. The parotid and submaxillary glands were enlarged and the throat inflamed. Temperature was 108°.

Initial treatment consisted of penicillin and a kaclin poultice. By next morning the puppy was unable to swallow and respiration was distressed. It was obvious that unless tracheotomy was performed the patient would die before treatment could be effective. Themalon (B.W. & Co.) was given as an analgesic, with local anaesthesia over the operation site.

As no tracheotomy tube of small enough diameter was available a piece of small calibre rubber tubing, suitably sterilised, was used. This was anchored with nylon sutures. Relief was immediate and the themalon inhibitor, lethidrone, was then given.

The puppy lapped milk the same night and was eating normally next day. Subsequent treatment with penicillin cleared up the throat infection and the tube was removed four days later, recovery being uneventful.

REPORT

British Council Report, 1952-53

The *raison d'être* of the British Council may be summed up in the following Chinese proverb quoted in the Council's most recent annual report :—

" If you plan for one year, plant grain.
If you plan for ten years, plant trees,
If you plan for a hundred years, plant men."

This report is another record of achievement in the development of cultural and scientific relations between the peoples of the world. Although it is impossible to measure the success of such difficult work by precise or statistical criteria, the modest and sincere presentation in this report gives one confidence that this vastly important job is being carried out conscientiously and well. Although hampered by a substantial reduction in its funds, it is particularly good to learn that the Council found it possible to go further towards satisfying the increasing demands for its services from many countries in Asia. On the other hand, the inevitable cessation of activities in China was a great disappointment.

In the agricultural field the Council was again busy in a variety of ways. Many of the 3,619 visitors to this country came to study methods of food production. Similarly, among the British specialists who were sent abroad on lecture and advisory tours, many were medical or agricultural scientists. In addition to the continued publication of the bi-monthly periodical the *British Agricultural Bulletin*, specialist courses in animal breeding, the mineral nutrition of plants, and techniques in field experimentation and advisory work were organised. D. E. T.

REVIEW

[The Principles and Practice of Feeding Farm Animals. By E. T. Holnan & F. H. Garner. Longmans, Green & Co. Price 25s.]

Here is a well-produced and well-printed book full of information of considerable interest to veterinarians and veterinary students.

The material is laid out in such a way that it is more readily accessible than in most books of this kind, and the authors are to be congratulated upon the arrangement.

The introduction includes a comparison between the digestive tracts of the different animals, from which one can the more readily assess their respective natural requirements. This leads one smoothly up to a consideration of feeding standards and methods of compounding rations, and details are given of a simplified method of preparing these which will have an appeal to those who have found the orthodox methods rather a headache.

One chapter is given over entirely to descriptions of feeding-stuffs in common use. This is comprehensive and covers every sort of food that is likely to be encountered.

The veterinary reader will appreciate the inclusion of a section relating to the uses of grassland and its importance in livestock production. Now that the significance of various methods of management is becoming more clear in relation to certain metabolic diseases of farm animals the study of this aspect of farming will have an even greater appeal to the veterinarian.

The nutritional requirements and methods of feeding cattle, dairy cows, sheep, pigs, horses and poultry are all dealt with in separate chapters, and what might otherwise be

(*Continued at foot of col. 1, page 191*)

VICTORIA VETERINARY BENEVOLENT FUND

MEETING OF COUNCIL

A meeting of the Council of the Victoria Veterinary Benevolent Fund was held at No. 10, Red Lion Square, London, W.C.1, on Thursday, February 4th, 1954, when the following members were present: Professor J. B. Buxton (President) in the chair, Major J. J. Dunlop, Mrs. Daisy I. Glover, Professors R. E. Glover, W. M. Mitchell, P. E. Mullaney, L. P. Pugh, Major Henry Sumner, Professor W. L. Weipers and Dr. W. R. Wooldridge. Mr. C. W. Francis, Secretary, was in attendance.

Apologies for Absence.—Letters of apology for absence were received from Messrs. E. P. Barrett, H. W. Dawes, L. E. Hughes, Professor J. McCunn, Captain J. W. Procter, Mr. Arnold Spicer, Captain A. Whicher and Major W. H. Wortley.

Minutes.—The minutes of the previous meeting held on September 30th, 1953, having been published, were taken as read and signed as correct.

Correspondence.—(*a*) A letter from Captain J. W. Procter tendering his resignation as a member of Council was received with much regret.

(*b*) A letter was read from Messrs. Sparling, Benham and Brough informing the Council that the Fund had been left a legacy of £20 out of the estate of the late Major E. F. H. Noel, M.R.C.V.S.

(*c*) The Secretary read a letter from Mr. John A. Flynn, Hon. Treasurer, Veterinary Medical Association of Ireland, enclosing cheque for £362 10s. 3d. of which £163 2s. 5d. represented the proceeds of a Greyhound Racing Meeting which had been arranged by the Association.

It was resolved:—

> "That a letter expressing the Council's warm thanks on receiving such a substantial contribution be sent to the Veterinary Medical Association of Ireland."

R.C.V.S. Annual Fees.—The question as to whether the Fund should pay the annual fee of members who are recipients of the Fund having been raised, it was resolved:—

> "That the Council should not on principle undertake the payment of the annual fee of recipients, to enable them to retain their names in the Register of Veterinary Surgeons."

Treasurer's Report.—In the absence of the Treasurer the Secretary read the Treasurer's report and it was agreed that his action in causing the balance in the Donations Account to be invested in the purchase of £323 10s. 4d. 3½ per cent. Conversion Loan be approved.

Accountant's Report.—The Secretary read the following report, which was approved, a cordial vote of thanks being accorded to the respective donors.

Since the previous meeting the following legacy, special subscriptions and donations have been received:—

	£ s. d.	£ s. d.
Legacy		
From the Estate of Major E. F. H. Noel, M.R.C.V.S.		20 0 0
Special Subscriptions		
Fulton, A.	2 2 0	
Southern Counties Veterinary Association	5 5 0	7 7 0
Donations		
Association of Veterinary State Officers	5 5 0	
Cranleigh and West Surrey Farming Club (*per* E. P. Barrett)	2 2 0	
"In memory of Mr. W. Brown, M.R.C.V.S." Kirk, W. H., Wright, A. J.	3 3 0	
Croydon Canine Society (*per* Miss B. M. Murray)	5 5 0	
Eastern Counties Veterinary Society—Shipley Bowls Tournament	1 14 6	
Eaton, G. (*Life Membership*)	10 10 0	
Kensington Canine Society (*per* Miss B. M. Murray)	5 5 0	
Ladies Kennel Association (*per* Miss B. M. Murray)	5 5 0	
Lancashire Veterinary Association (Annual Donation increased from Five Guineas)	10 0 0	
Mid-West Veterinary Association—Dance	14 1 1	
North of England Veterinary Medical Association—Dance	64 0 0	
North of Ireland Veterinary Medical Association—Raffle held at Annual Dance	50 0 0	
Procter, J. W.	1 0 0	
R.S.P.C.A. Southampton Branch—two donations @ £12 10s.	25 0 0	
Stewart, J. L.	5 5 0	
Trowell Parent Teacher Association Gymkhana (*per* T. C. Denholm) ...	1 1 0	
West of Scotland Division	10 0 0	
Whicher, A. (two donations @ 10s. 6d.)	1 1 0	219 17 7
Collecting Boxes		
Beckett, Mr. & Mrs. R. L.	2 0 0	
Brancker, Miss W. M.	1 16 0	
Bruford, J. W.	12 6	
Central Veterinary Society (total of four collections)	8 14 10	
Chambers, Franklin & Chambers ...	1 14 6	
Eastern Counties Veterinary Society	11 16 4	
East Midlands Division (two collections)	4 18 0	
Gillmor, H.	1 1 0	
Hewer, Spriggs & Wilson	1 8 9	
Hopson, C. G.	3 3 0	
Lincolnshire & District Division ...	3 2 0	
Low, J. J.	11 0	
Mid-West Veterinary Association ...	10 4 0	
Morton, J. T.	1 3 6	
North of England V.M.A.	3 14 6	
North of Scotland Division	4 12 6	
North Wales Division	4 8 2	
Pasfield, J.	1 1 0	
Rix, C. E., & Furniss, R. H.	1 10 0	
Royal Counties Veterinary Association	9 10 0	
Russell, Miss E.	2 12 0	
Scottish Branch, B.V.A.	4 13 6	
Scottish Metropolitan Division ...	3 4 0	

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heavy going is considerably enlightened by correlating the nutritional story with the life story of the animal, which enables one automatically to achieve a better over-all understanding of the habitat of the animal—which we have now recognised to be so important.

The series of eight tables in the appendix relating to ready reckoning methods, the mineral content of common feeding-stuffs, and the composition and nutritional value of the same, will be found very helpful. One could fairly expect to find here a table of the vitamin contents of certain foodstuffs which assume to-day an all-important rôle within the health picture, but this is absent. Such criticism is, however, but a finger-flick in the face of such an admirable production.

Scottish Regional Group of the Association of Veterinary Teachers and Research Workers	2	0	0			
South Eastern Veterinary Association	9	0	0			
Veterinary Investigation Officers Annual Conference	4	13	8			
Western Counties Veterinary Association	16	18	0			
West of Scotland Division	7	16	0			
Yorkshire Veterinary Society	7	0	0	134	18	9
				£382	3	4

The Secretary also informed the Council that since the last meeting he had received the following Deeds of Covenant: one for £5 5s.; two for £2 2s.; 15 for £1 1s.; 13 for 10s. 6d. Of these, three for £1 1s. and two for 10s. 6d. came from new contributors while the remaining 26 were from subscribers who had very kindly undertaken to pay their subscription under Covenant for a second period of seven years.

In 1947, when this scheme was first introduced, 37 subscribers contracted to pay under Covenant and £28 15s. 1d. was recovered in income tax. In the ensuing year the Fund will benefit to the extent of £58 12s. 7d. from 67 Covenanters.

Life Member.—It was resolved that Mr. George Eaton, having paid a fee of 10 guineas, be elected a life member of the Fund.

V.V.B.F. Christmas Gift Account

(*a*) *Christmas Gifts.*—The Secretary reported:—

(i) That in response to the Executive Committee's appeal in *The Veterinary Record* in December the handsome sum of £74 14s. had been received.

(ii) That the Executive Committee in collaboration with Mrs. D. I. Glover (President of the Ladies' Guild) had distributed during December grants ranging from £6 to £15 to 35 recipients.

(iii) That in addition, one recipient with young children had also received a parcel of groceries kindly sent to her by a lady member of the Fund.

(*b*) *Alteration of Present Designation.*—A discussion having taken place on the suitability of the present title, namely, V.V.B.F., Christmas Gift Account, it was agreed in view of the fact that payments are no longer confined to the Christmas period that this account in future be designated "V.V.B.F., Special Gift Account," and accordingly it was resolved:—

> That the National Provincial Bank Ltd., 114, High Holborn, London, W.C.1, be instructed to change the name of the Current and Deposit Accounts at present designated "V.V.B.F., Christmas Gift Account" to "V.V.B.F., Special Gift Account."

Cases

No. 266.—M.R.C.V.S. The Secretary reported that this member died on December 3rd, 1953, at the age of 89, leaving a widow, aged 87, and daughter, aged 53. He also reported that he had ascertained from the National Assistance Board that no alteration in the pension and assistance which they were giving in this case would be made, provided any allowance we gave to the widow and daughter did not exceed 10s. 6d. per week each.

It was resolved that the officer of the National Assistance Board be thanked for his valuable assistance and that the bank be instructed to arrange the payment at the rate of 10s. 6d. per week each to the widow and daughter.

No. 275.—Widow; aged 48; two sons, aged 19 and 17; former at present on National Service and the latter farming. The Secretary informed the Council that as instructed at the last meeting he had contacted a member of the Ladies' Guild who kindly visited this recipient early in December. Her report having been read to the meeting it was resolved that the member be thanked for her visit and for the invaluable report which she had submitted on this case.

No. 281.—Widow; aged 51; suffering from neurasthenia; two children, aged 20 and 13.

It was resolved that the reconsideration of this case be deferred to the next meeting.

No. 287.—M.R.C.V.S.; aged 37, married, one child. The Secretary reported that this recipient had fully recovered from his accident and had obtained employment in the profession as from November 30th, 1953. The Executive Committee had accordingly discontinued his grant.

The action of the Executive Committee was approved.

No. 290.—Widow; aged 58; daughter and son, aged 18 and 15, respectively. Applicant operated on for glaucoma 12 months ago. Case due for review.

After hearing a verbal report on this case it was agreed that the present grant be continued.

No. 295.—Widow; aged 39; one daughter, aged four. Husband died November 15th, 1953. Applicant at present under the doctor. Receiving widow's pension of £2 13s. per week for a period of 13 weeks. It was agreed to leave this matter in the hands of the Executive Committee.

No. 296.—M.R.C.V.S.; aged 58; suffering from acute crippling arthritis. The Council decided that a local member be asked to make further enquiries into this case and on receiving his report that the Executive Committee be empowered to take such action as it deems desirable.

Date of Next Meeting.—It was agreed that the date of the next meeting be left in the hands of the Executive Committee.

Any Other Matters.—On the proposition of Professor W. M. Mitchell a hearty vote of thanks was accorded to the President for his conduct in the chair, and the meeting then terminated.

QUESTION IN PARLIAMENT

Committee of Enquiry on National Stud

Mr. Crouch (March 18th) asked the Minister of Agriculture if he will consider holding an enquiry into the running of the National Stud.

Sir T. Dugdale: Yes. I have decided to appoint a Committee with the following terms of reference:—

> "To consider whether the present policy and methods of operation of the National Stud are best suited to achieve the object of assisting in the maintenance and development of the bloodstock industry, whilst working on a sound financial basis; and to make recommendations."

I am glad to say that Sir Percy Loraine has agreed to act as Chairman of the Committee. The other members will be Mr. E. J. Bunbury, Sir Donald Fergusson and Sir Francis Weatherby.

NOTES AND NEWS

Diary of Events

Mar. 31st.—Meeting of the Technical Development Sub-committee on the Calf Report, 7, Mansfield Street, W.1, 11 a.m.

Apr. 1st.—Meeting of the Technical Development Committee, B.V.A., at 7, Mansfield Street, W.1, 10.30 a.m.

Apr. 2nd.—Joint Ordinary General Meeting of the A.V.T. and R.W. at the Royal Veterinary College, Camden Town, N.W.1, 10 a.m.

Apr. 3rd.—Annual Dinner of the B.R.X. Club at the Royal Veterinary College, Camden Town, N.W.1, 6 p.m.

Apr. 7th.—Ordinary Meeting of the Association of Veterinary Teachers and Research Workers (Northern Region) in the Department of Veterinary Pathology, Bedford Street North, Liverpool, 7, at 10.30 a.m.

Apr. 10th.—Reunion Dinner of the R.V.C. '52 Club at "Ye Miller of Mansfield," Streatley, 7.30 p.m.

Apr. 11th.—Joint meeting of the South-East Midlands Division, B.V.A., and the Kettering and District Medical Association at Kettering General Hospital, 7 p.m.

Apr. 15th.—General Meeting of the Hertfordshire and Bedfordshire Division, B.V.A., at 78, Holywell Hill, St. Albans, 7.30 p.m.

May 6th.—A symposium on "The Design of Animal Houses" at the Royal Society of Medicine, 1, Wimpole Street, London, W.1, 10.45 a.m.

Sept. 19th—25th.—72nd Annual General Meeting and Congress of the British Veterinary Association at Torquay.

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B.V.A. Council and Committee Meetings at the University of Glasgow

Monday, April 12th

10.30 a.m. Veterinary State Medicine Committee.
2.15 p.m. Home Appointments Committee.
3.30 p.m. Parliamentary and Public Relations Committee.

Tuesday, April 13th

10.30 a.m. Organising Committee.
1.45 p.m. General Purposes and Finance Committee.

Wednesday, April 14th

10.0 a.m. Council Meeting.

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PERSONAL

Births.—Briault.—On March 12th, 1954, at Redditch, to Pat, wife of Michael Briault, B.Sc., M.R.C.V.S., a daughter—Claire Amanda, sister for Victoria.

Brown.—On March 3rd, 1954, to Jean, wife of Alan R. Brown, M.R.C.V.S., a daughter—Catherine Mary.

Gibson.—On March 13th, 1954, at Cambridge, to Joan, wife of E. A. Gibson, M.R.C.V.S., a son—David Anthony.

Hartley.—On March 15th, 1954, at Wincanton, Somerset, to Joan, wife of Derek C. Hartley, M.R.C.V.S., a son—Christopher Phillip.

Hay.—On March 18th, 1954, at Cirencester Maternity Hospital, to Cynthia (*née* Carter), wife of I. F. S. Hay, M.R.C.V.S., of 15, Lewis Lane, Cirencester, a son—Andrew.

Moody.—On March 17th, 1954, at The Gables Maternity Home, Redditch, to Honor (*née* Barnacle), wife of Frank C. Moody, B.Sc., M.R.C.V.S., of 6, Meadow Hill Crescent, Redditch, a sister for John and David.

Wilson.—On March 10th, 1954, at Struan Lodge Maternity Home, Dunoon, to Margaret Lennie, M.R.C.V.S., wife of John E. Wilson, Westland, Toward Point, Argyll, a son.

Marriage.—Ryde—Stiff.—On March 13th, 1954, at St. Mary's Church, Kersey, Paul Scrivener Ryde, B.Sc., M.R.C.V.S., only son of Mr. E. S. Ryde, Gun Inn, Dedham, and the late Mrs. Ryde, to Nora Olive, only daughter of Mr. and Mrs. C. H. Stiff, of Linton House, Kersey.

. . . . .

Will.—Mrs. Laetitia Ethel Tutt, of "Downstead," Twyford, near Winchester, widow of John Boon Tutt, F.R.C.V.S., of Winchester, who met her death in the hunting field on December 30th last, left £127,608 (net £127,175), duty paid, £59,197.

Probate has been granted to her two executors, Messrs. T. L. Wilson, Stockbroker, of Caulcott House, Lower Heyford, Oxford, and J. F. D. Tutt, F.R.C.V.S., of "Rothiemurchus," St. Cross, Winchester. Amongst other legacies and bequests, she left £500 each to the British Empire Cancer Campaign, and to the Royal Veterinary College and Hospital. She expressed the wish that the latter legacy should be set aside and used exclusively for the work of the Beaumont Animals' Hospital.

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R.C.V.S. Council Elections, June, 1954

The Annual General Meeting of members of the Royal College of Veterinary Surgeons will be held on Tuesday, June 1st, 1954, at the Royal College of Veterinary Surgeons, 10, Red Lion Square, London, W.C.1, at 12 o'clock. At this meeting will be declared the result of the election of five members of Council elected by members of the College residing outside the Republic of Ireland. The following is a list of the members who are standing for election this year:—

Allan, H. B. (Harrogate)—proposers, G. N. Sutherland, W. R. McKinna.

Barr, J. (Penrith)—proposers, W. G. Robinson, A. Young (Dumfries).

Bateman, J. K. (Potters Bar)—proposers, J. McCunn, A. Sams.

Formston, C. (Streatley)—proposers, S. L. Hignett, W. C. Miller.

Holman, H. H. (Compton)—proposers, W. S. Gordon, I. H. Pattison.

Holroyd, H. (Blackburn)—proposers, E. R. Callender, J. W. Bruford.

Hughes, D. L. (Thurgarton)—proposers, E. Wilkinson, G. R. Benbow.

Joshua, Miss J. O. (London)—proposers, F. B. Halpin, Miss C. A. Woods.

Peele, J. D. (Durham)—proposers, J. Wharrier, D. F. McFarlane.

Tutt, J. F. D. (Winchester)—J. M. Ingram, J. McCunn.

Wilson, H. M. (Cupar)—proposers, C. S. Grunsell, J. T. Stamp.

Wright, A. J. (Macclesfield)—proposers, Alex. Thomson (Glasgow), H. F. Hebeler.

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R.C.V.S. OBITUARY

Doughty, William Allan, The Bungalow, Nether House, Alnwick, Northumberland. Graduated Edinburgh, December 16th, 1907. Died March 19th, 1954.

Phillips, Reginald Leggo, of 9, Meadow Lane, Loughborough, Leicestershire. Graduated London, July 13th, 1904. Died March 20th, 1954.

Quinlan, David, Cages Farm, Whipstead, Bury St. Edmunds, Suffolk. Graduated London, December 16th, 1904. Died March 16th, 1954; aged 73 years.

Sisson, Kenneth Garforth, Oversley, New Road, Bromsgrove, Worcester. Graduated Liverpool, December 19th, 1919. Died March 12th, 1954; aged 57 years.

Thompson, Alexander, 56, Chichester Street, Belfast. Graduated Dublin, December 11th, 1930. Died February 22nd, 1954.

Alexander Thompson, M.R.C.V.S.

A Personal Tribute

The death of Alexander Thompson, which occurred on February 22nd, caused great sorrow to his colleagues in Northern Ireland. The son of the late S. R. Thompson, M.R.C.V.S., he and his brother Jim carried on the old-established practice in Chichester Street, Belfast.

He was educated at the Royal Belfast Academical Institution and qualified at Ballsbridge Veterinary College.

It was my privilege to have known him all his life; we played together as boys and later we practised quite close to each other. Of a quiet nature, he never sought the limelight, but he was one whose friendship was valued and his kindly patience endeared him to us all.

Alex. had only one hobby in life—his work. No day was too long for him for he loved to be amongst his clients, and they talked to him as a friend because he was interested in their work. Even when illness had sapped his energy he kept attending to the work he loved so well.

For many years he was a member of the North of Ireland branch of the B.V.A. His quiet nature prevented him from taking part in the discussions, but there was no more welcome member at our association.

In his passing his clients have lost a sound clinician. To his widow and family we extend our deepest sympathy.

A. McL.

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John Going, M.R.C.V.S.

An Appreciation

There must be many members of our profession who knew John Going in his Army days at Doncaster during the last war, and also during his long sojourn in the Sudan. Everyone who met him would appreciate his absolute integrity, his abhorrence of anything underhand, and his complete impatience with anything in the nature of cant or humbug.

I was introduced to John Going by his former chief, Brigadier Charles Murray, in the last year of the war, and John promptly became a colleague of mine in the greyhound world, and a friend who remained firm and true until almost the last hour of his life. A man of outspoken opinions but with a heart of gold, he worked to the very end. He had suffered much pain at intervals for the last three years, yet he never allowed himself to be depressed by his affliction. The genial smile which invariably followed his sudden, lovable outbursts of impatience got rather less pronounced in his last months. We were all desperately sorry for him, but he sought no sympathy and carried on with his job in a way which would have been a credit to many younger men. He finished his work and left everything in order on the afternoon of March 4th, and died in his armchair at home on the same evening, having known all day that the end was very near.

We have lost a wonderful colleague and our sympathy goes to his sorrowing widow, who lost him with such startling suddenness.

J. K. B.

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HOLIDAY IN FRANCE

Dr. Godéchoux, of Bailly-Romainvilliers, Par Serris, Seine et Marne, Chief Editor of *L'Action Vétérinaire*, wishes to arrange an exchange between his grandson, Jean-Michel Labonnélie, aged 15, who wants to become a veterinary surgeon, and the son or daughter (Jean-Michel has a younger sister and brother) of an English veterinary surgeon *in country practice*.

He would like Jean-Michel to come to England during the Easter holidays from April 11th to 24th and for one month in the summer holidays—either July, August or September. In return he offers hospitality to an English child for two months during the summer holidays—July to September. In July and August the family will be staying by the sea at the Isle of Oléron, and in September they will be at Paris or nearby. (At Easter the family will be travelling and so would not be able to receive the visit of the English boy or girl at that time.)

Dr. Godéchoux also states that he would be willing to insert notices concerning exchanges between the children of British and French veterinary surgeons in his journal *L'Action Vétérinaire*.

Would any member interested please notify the General Secretary, B.V.A., 7, Mansfield Street, London, W.1.

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GIFT TO THE ANIMAL HEALTH TRUST

The "*Horse and Hound*" Ball, which has become of recent years one of the most attractive events of the season, was held at Grosvenor House, Park Lane, on March 18th. About 1,300 guests attended, many of them in hunting pink. The profit from the Ball is to be divided between the Animal Health Trust and the British Field Sports Society. Last year the profit was about £900, and to all appearances it will be equalled, if not surpassed, on this occasion.

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UNREGISTERED PRACTITIONER FINED

As a result of summonses brought by the Royal College of Veterinary Surgeons, Miss Dorothy Graham-Turnbull, of Heaton Norris, was recently found guilty by the Stockport magistrates of practising veterinary surgery while not registered. She was fined £3 on the first summons, and 10s. on each of eight others. Miss Graham-Turnbull pleaded not guilty; but the Bench found the expression "canine specialist," used by her, to suggest a registered veterinary surgeon, which she was not.

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BULL LICENSING

At a meeting in London, the Executive of the National Cattle Breeders' Association decided to send an urgent request to the Ministry of Agriculture, asking it to convene a conference to discuss standards for bull licences, whether beef, dairy or general, which would be acceptable throughout the United Kingdom.

The National Cattle Breeders' Association has always maintained that it is in the interests of all that there should be complete interchangeability of bull licences between England and Wales, Scotland and Northern Ireland, and that common standards acceptable to all countries can and should be achieved.

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DISEASES SPREAD BY AIR TRANSPORT

The World Health Organisation has been giving some attention to the possible spread of diseases through air transport. It is observed that in spite of the precautions taken by the leading air lines insects may lodge in the cabins of aircraft, among the passengers' luggage, or even on their clothes.

The behaviour of insects in aircraft flight has been the subject of investigation and it has been shown that they are not permanently affected by changes in air pressure or temperature. Similarly, eggs laid by these insects can survive even if laid on the outside of the aircraft, including the propeller. A parallel is drawn between the diseases carried for centuries by sea and river transport and those now suspected to be carried by air transport. The World Health Organisation suggests that governments should make uniform regulations to prevent, so far as is scientifically possible, the aircraft and its passengers becoming carriers of infection from country to country.

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EASTER CONGRESS OF UFAW

The Universities Federation for Animal Welfare is holding its Easter Congress at College Hall, Malet Street, London, W.C.1, from April 6th to 9th. The programme includes a lecture, "The Attitude of the Farmer to Disease and Health in his Livestock" by Dr. N. S. Barron, M.R.C.V.S., and another, "Animals and Research" by Dr. P. P. Scott, of the Royal Free Hospital

Medical School. On April 7th Mr. Oliver G. Jones, M.R.C.V.S., Curator of Mammals and Veterinary Officer, will conduct delegates round the London Zoo, and will give a short talk on "Some Problems of Keeping Wild Animals in Captivity." A letter from the organiser of the Congress states that members of the Profession will be welcome whether they are members of UFAW or not. Enquiries should be made from Miss Williams, Branch Organiser, UFAW, 7, Red Lion Square, London, W.C.1.

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AGRICULTURAL STATISTICS (ENGLAND AND WALES)

THE FOLLOWING TABLES GIVE THE RESULT OF THE DECEMBER, 1953, AGRICULTURAL RETURNS IN ENGLAND AND WALES FOR ESTIMATED NUMBERS OF LIVESTOCK

Description	Thousands Dec. 1952	Dec. 1953
Cows and heifers in milk :		
For producing milk or calves for the dairy herd	1,915	2,014
Mainly for producing calves for beef ...	221	253
Cows in calf, but not in milk :		
Intended for producing milk or calves for the dairy herd	591	592
Intended mainly for producing calves for beef	156	166
Heifers in calf with first calf	461	451
Bulls being used for service	81	78
„ (including bull calves) being reared for service	32	30
Other cattle :		
Two years old and over : Male	535	557
Female	653	667
Total	(1,188)	(1,224)
One year old and under two : Male ...	395	459
Female ...	889	986
Total ...	(1,284)	(1,446)
Under one year old : Male	476	526
Female	1,130	1,079
Total	(1,606)	(1,605)
TOTAL CATTLE AND CALVES	7,534	7,859
Sheep one year old and over :		
Ewes kept for breeding	4,814	5,160
Shearling ewes (or gimmers)	1,058	1,160
Rams kept for service	146	156
Other sheep one year old and over	644	748
Total one year old and over	(6,662)	(7,224)
Sheep and lambs under one year old :		
Ram lambs for service...	38	40
Ewe lambs put to the ram in current year ...	312	334
„ lambs not put to the ram but retained for breeding	924	959
Other sheep and lambs under one year old ...	2,612	2,959
Total under one year old	(3,886)	(4,292)
TOTAL SHEEP AND LAMBS	10,547	11,516
Sows in pig	248	298
Gilts in pig	90	120
Other sows kept for breeding	150	182
Total sows for breeding	(488)	(599)
Barren sows for fattening	27	*
Boars being used for service	27	34
Young boars being reared for service	10	*
All other pigs :		
Five months old and over	1,170	1,026
Two months old but not yet five months old ...	1,616	1,917
Under two months old	819	1,036
TOTAL PIGS	4,158	4,623
Fowls :		
Six months old and over	36,571	38,127
Under six months old	5,780	5,584
Total	(42,351)	(43,711)
Ducks, geese and turkeys of all ages	2,813	2,795
TOTAL POULTRY	45,164	46,506

* Not collected separately in 1953 ; included in "All other pigs."

COMPULSORY ATTESTATION IN CUMBERLAND AND WESTMORLAND

At a well-attended meeting held recently in Penrith, Mr. J. K. S. Elmslie, Divisional Veterinary Officer for Cumberland, described the intention of the Ministry of Agriculture to make Cumberland and Westmorland, the Furness area, and a section of the Pennines, a tuberculosis eradication area. He said that all cattle which fail to qualify for attestation in this area after March 1st next year will be slaughtered, and their owners will be reimbursed up to a maximum limit of £100 for any single animal. During the past year 1,000 farmers in Cumberland have made application for free testing of their cattle, and he reminded his audience that anyone could apply to have cattle attested; this could be done by their own veterinary surgeon.

Questioned about the importation of Irish store cattle after the introduction of the scheme, Mr. Elmslie emphasised that no unattested cattle would be allowed into the area. Irish cattle would be admitted only if they were fully attested or had passed a tuberculin test within the previous fortnight.

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PAN-AFRICAN CONFERENCE IN ALGIERS

Dr. P. Jore D'Arces, President of the Committee, informs us that a Pan-African Conference on Zootechnical Matters is being organised at Algiers from October 17th to 25th, 1954, and members of the veterinary profession in this country are cordially invited to attend.

The programme is to be as follows:—

(1) L'Insemination Artificielle—Rapporteur Dr. Vet. Anderson, Naivasha, Kenya.

(2) La Peripneumonie Contagieuse, Rapporteur Dr. Vet. Silva Nunez Araujo, Nova Lisboa, Angola.

(3) Les Trypanosomiases, Rapporteur Dr. Vet. X. . . .

(4) Utilisation des ressources en viande du Continent Africain, Rapporteur Dr. Vet. Receveur, Fort-Lamy, Tchad, A.E.F.

(5) La Peste Bovine, Rapporteur Dr. Vet. Mornet, Dakar, Senegal, A.O.F.

(6) Les Piroplasmoses Bovines, Rapporteur Dr. Vet. Donatien, Alger, Algerie.

(7) Les Carences Minerales, Rapporteur Dr. Vet. X. . . ., Union Sud Africaine.

Anyone interested in these meetings should communicate with Dr. R. Camou, S.V.Z.A., 3, rue Pelissier, Alger.

N. S. B.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Ayr.—Merryhill Farm, Stewarton, Kilmarnock (Mar. 19).
Dorset.—Sunnyside Farm, Halstock, Yeovil (Mar. 12).
Lancs.—Holme Farm, Balderstone, Blackburn (Mar. 18).
Norfolk.—Grove Farm, Horning, Norwich (Mar. 15).
Renfrew.—Bogside Farm, Inverkip, Greenock (Mar. 13).
Salop.—Burleydam Farm, Burleydam, Whitchurch (Mar. 12).

FOOT-AND-MOUTH DISEASE:

Staffs.—Lower Farm, Dodsleigh, Stoke-on-Trent (Mar. 17).

FOWL PEST:

Cambs.—Orchard House, Town Lane, and Arbenoys, Sun Street, Isleham, Ely (Mar. 15); Boot Shop, Mill Street; Inhams Farm, and The Vicarage, Isleham, Ely (Mar. 16); Primrose Cottage, Bowers Lane, Isleham (Mar. 17).

Lancs.—Bank Farm, Station Road, Little Hoole, Preston; Bury Farm, Brindle, Chorley (Mar. 15); Little Close Farm, Abbey Village, Penwortham, Preston; The Bungalow, Jubilee Lane,

Marton Moss, Blackpool (Mar. 16); Rose Dale, Gill Lane, Longton, Preston; Ribblesdale Farm, Little Hoole; Ivydene, Town Lane, Much Hoole, Preston (Mar. 17); Wood View, Croston Drive, Rufford, Ormskirk (Mar. 18).

Lincs.—Lincoln Lane Farm, Metheringham, Lincoln (Mar. 18).

Middx.—Illhouse Allotments, Harefield (Mar. 19).

Yorks.—4-9, Council Piggeries, Ilkley; Allotments adjoining Locomotive Shed, Little Lane, Ilkley (Mar. 19).

SWINE FEVER:

Bucks.—18, North End Road, Steeple Claydon, Bletchley (Mar. 18).

Cambs.—Old Field Buildings, Landbeach, Cambridge (Mar. 16).

Ches.—" Brook View," Wybunbury, Nantwich (Mar. 16); " The Oaklands," Puddington, Wirral (Mar. 18).

Glouc.—Gayneys Well, Lansdown, Stroud (Mar. 16).

Isle of Ely.—31, The Crescent, Littleport (Mar. 19).

Lancs.—The Poplars Farm, Sefton, Liverpool (Mar. 16); Hook Lane Piggeries, Poulton-with-Fearnhead, Warrington (Mar. 19).

Leics.—Meton Road Allotments, Ashfordby Hill, Ashfordby, Melton Mowbray (Mar. 18).

Norfolk.—Manor House Farm, Colkirk, Fakenham (Mar. 16); 26, Brooks Road, Horsford, Norwich (Mar. 19).

Notts.—" Hillcrest," Melton Road, Stanton-on-the-Wolds, Nottingham (Mar. 15).

Suffolk.—Stanchills Farm, Hengrave, Bury St. Edmunds (Mar. 15); Osier Cottage, Riskinghall Superior (Mar. 16); The Common, Beck Row, Mildenhall, Bury St. Edmunds (Mar. 18).

Surrey.—The Butchers Shop, High Street, Old Oxted (Mar. 16).

Sussex.—Keepers Piggeries, Hampers Lane, Washington (Mar. 20).

Worcs.—The Cottage, Dough Bank, Ombersley, Droitwich (Mar. 15); Cider Mill, Bastonford, Powick (Mar. 18).

Yorks.—Woodview Allotments, Maltby, Rotherham; East Carr Lane, Sutton, Hull; Stansfield Row Piggeries, Kirkstall Road, Leeds, 4; Delph Slack Farm, Delph, Huddersfield (Mar. 15); Holme Lane Farm, Grenoside, Sheffield (Mar. 16); Grove House Farm, Wyke Lane, Oakenshaw, Bradford (Mar. 18); Glebe Farm, Hilston, Withersea (Mar. 19).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

R.C.V.S. ELECTION MANIFESTOS

Sir,—Twelve members are candidates for the R.C.V.S. elections this year. It is unlikely that most of the electorate know all of these worthy people personally, and even acquaintance with all the candidates would not necessarily mean accurate knowledge of their attitude towards the problems of the profession.

It may well be this lack of knowledge, rather than apathy, which is the cause of the low polling we so regret in recent elections.

May I appeal, therefore, to all these members to submit election manifestos to the columns of the *Record*, so that we may judge them?

I for one will not vote for a policy of which I know nothing, nor for nebulous and undefined ideals of " Service," however well I may think of the candidate as a person.—Yours faithfully, BRENDAN HALPIN, 6, Passey Place, Eltham, S.E.9. *March 12th*, 1954.

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" A FARROWING PHENOMENON "

Sir,—In the December 12th, 1953, edition of *The Veterinary Record*, in the Correspondence section, you published a letter regarding " A Farrowing Phenomenon." I thought it might be of interest to cite to you a similar case brought to my attention by Dr. R. A. Barcalow, of Fairgrove, Michigan, U.S.A. Dr. Barcalow stated that on April 30th, 1950, he saw a yearling sow that had given birth to six pigs on April 16 and which on April 29th had given birth to nine more. It was her first litter, and the sow had been bred only once. Although the interval between farrowings was not as great as that reported by Andrew Buie, it nevertheless reflected the same type of farrowing phenomenon.—Yours faithfully, H. W. DUNNE, Professor of Veterinary Science in Charge of Veterinary Research, The Pennsylvania State University, School of Agriculture, State College, Pennsylvania, U.S.A.

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HELMINTHIASIS IN ELEPHANTS

Sir,—Recently I was asked by the Borneo Company to visit their timber-hauling elephants in Sarawak. Several animals had died and surra was suspected. This suspicion was not justified subsequently as no trypanosomes were demonstrated either by microscopic examination of the affected animals' blood or by the inoculation of guinea-pigs.

In the course of this investigation I recovered at *post-mortem* the elephant stomach bot (*Cobboldia elephantis*) and the hookworm (*Bath mostomum sangeri*). Several of the elephants were heavily infested by this latter parasite. I am indebted to the kindness of Dr. F. H. S. Roberts, of the Veterinary Parasitology Laboratory, C.S.I.R.O., Brisbane, for classifying these elephant parasites.—Yours faithfully, A. H. FOSTER, Veterinary Division, Department of Commerce and Industry, Singapore. *December 1st*, 1953.

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PORTABLE PENS FOR DAIRY CALVES

Sir,—We have read the excellent abstract entitled " The Use of Portable Pens in the Control of Diseases of Dairy Calves " by N. S. B. (*The Veterinary Record*, **66**, 6, 97, February, 6th, 1954) and invite your attention to an error wherein the pen is described as being 16 by 8 feet, with 3 feet at one end being roofed over. These figures are actually partial dimensions of one of the " other enclosures." In reality, the portable pens described in the original article (Davis, Bowman & Porter, *Vet. Med.* **47**, 485, 1952) are only 5 by 10 feet with 5 feet being covered by a roof. Pens larger than this are not easily portable.

It is gratifying to learn that the portable pen system is under investigation there and is giving hopeful results.—Yours faithfully, DALE A. PORTER, Director of the Regional Laboratory, United States Department of Agriculture, Agricultural Research Service, Auburn, Ala. *March 9th*, 1954.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Sheep Scab	Swine Fever
16th to 28th February, 1954 ...	8	5	83	—	54
Corresponding period in—1953	33	1	11	—	94
1952	12	4	6	1	48
1951	24	—	46	—	27
1st January to 28th February, 1954 ...	44	8	319	—	224
Corresponding period in—1953	207	19	157	—	293
1952	74	26	45	1	162
1951	105	15	414	4	151

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at February 28th, 1954, was as follows:—

England	Wales	Scotland	Total (Great Britain)
55,434	29,476	28,940	113,850